

Estimating Patient Demand for Pain Physicians in the United States Using Google Trends Data

Nivetha Srinivasan MD¹, Aditi Master MD¹, Vasanth Selvam DO², Alejandro Hallo-Carrasco MD¹, Jean Daniel Eloy MD¹
Rutgers New Jersey Medical School¹, Good Samaritan University Hospital²



Introduction

- The US population 75+ is expected to grow by 74% by 2034, leading to an increase in the number of individuals likely to develop chronic pain conditions.
- There is a potential discrepancy between supply and demand of pain physicians that needs to be evaluated to determine potential gaps in care.
- This study seeks to estimate demand for pain physicians using internet search engine data and identify potential shortages at the state level.

Methods

- Google Trends data from 2013-2023 was searched for each US state and average relative search frequencies (RSF) were retrieved for the terms:
 - “pain physician”
 - “pain management doctor”
- Supply of active pain physicians was identified by utilizing the Centers for Medicare and Medicaid national database
- Pain physician per capita values were computed by dividing Census Bureau state population estimates with number of respective physicians per state
- Relative demand index was quantified by dividing per capita values with RSF values which was then standardized on a scale of 0-100 to generate a scaled demand index (SDI)
- Statistical analysis:** Spearman’s rho correlation tested the relationship between SDI and 2023 state health rankings, from 1 (best) to 50 (poorest) from America’s Health Rankings group

Conclusions

- This study sheds light on states, particularly in the Southern US, facing potential gaps in pain management care likely due to an aging population and projected shortages of specialists to meet the increasing demand.
- This information can provide insight regarding career choices and practice building to pain physicians and residents considering a pain fellowship.
- There is a correlation between states with higher SDI and states that have poorer health rankings, indicating a need to expand access to care at the state level
- Differences seen in search results between “pain physician” and “pain management doctor” may be due to variations in health literacy of the US population

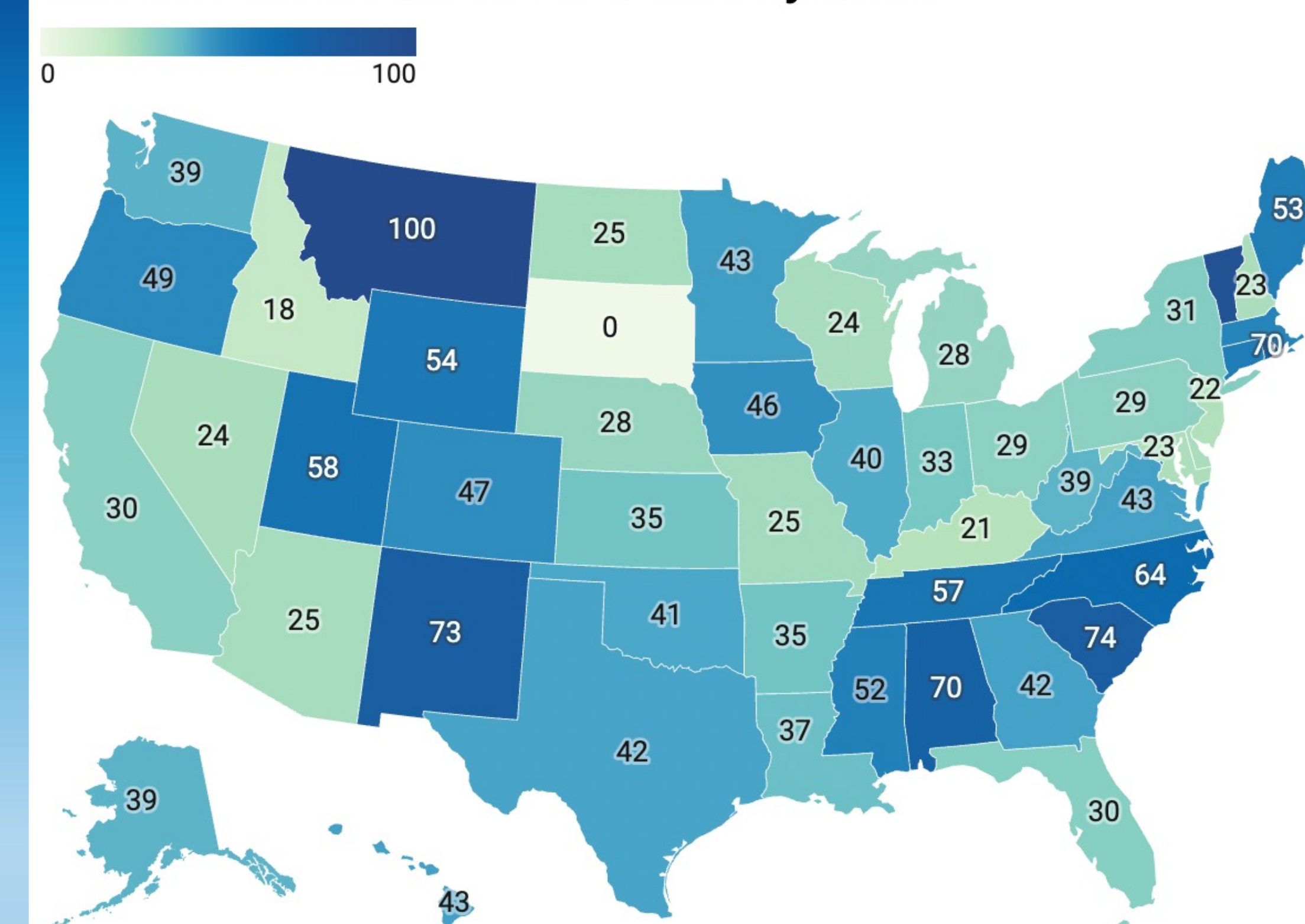
Several states, especially in the Southern region of the US, have a discrepancy between supply and demand for pain physicians.



RUTGERS HEALTH
New Jersey Medical School

Figures

Scaled Demand Index for "Pain Physician"



States with Highest SDI for
“Pain Physician”:

- | | |
|-------------------|-----------------|
| 1) Montana | 4) New Mexico |
| 2) Vermont | 5) Rhode Island |
| 3) South Carolina | 6) Alabama |

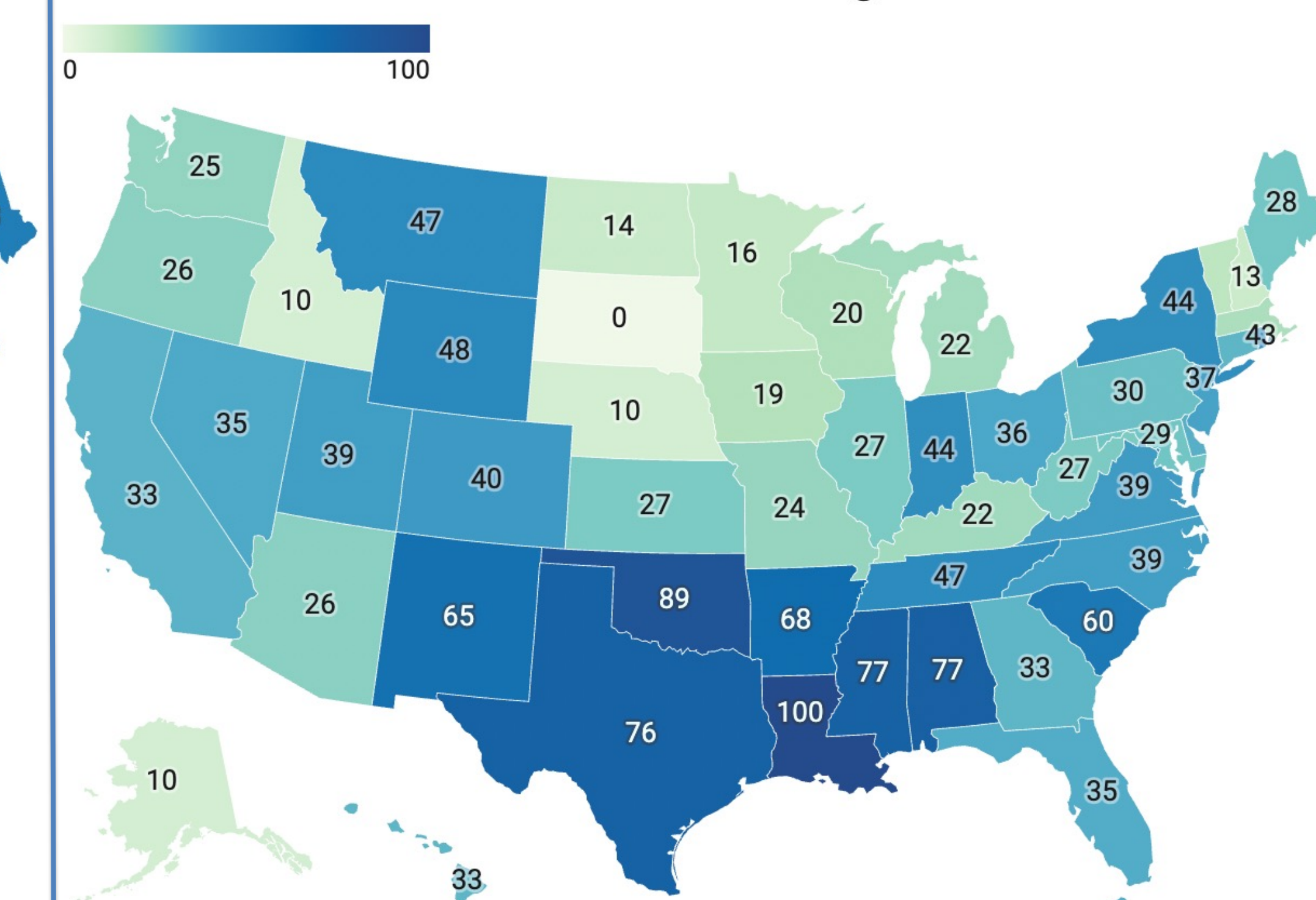
Highest number of pain physicians per capita:

- 1) South Dakota (13)
- 2) Delaware (5)

Lowest number of pain physicians per capita:

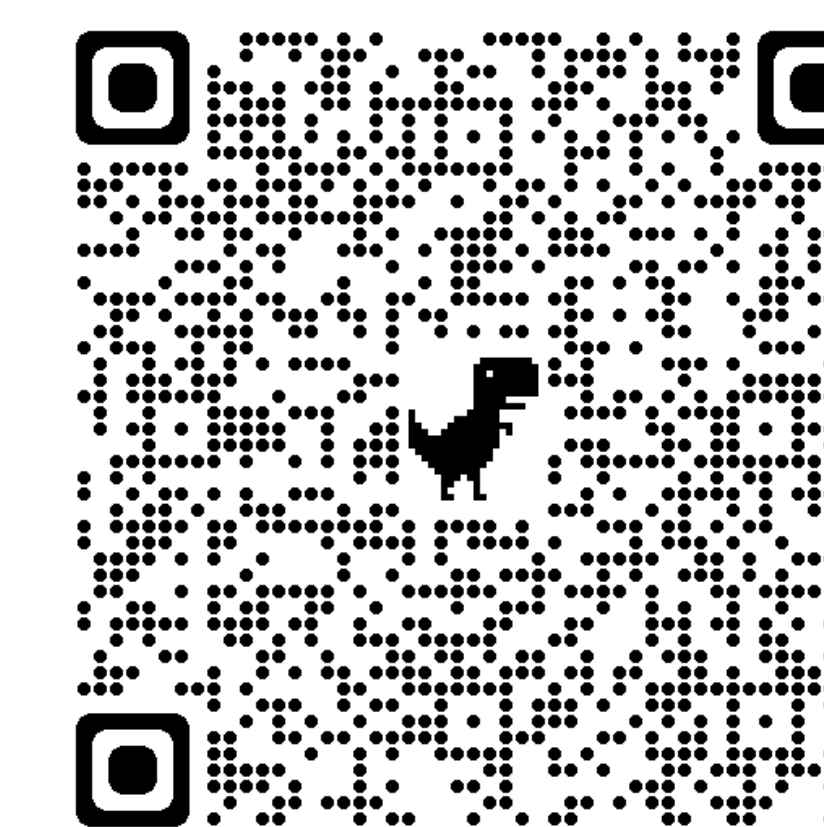
- 1) Montana (0.85)
- 2) Wyoming (0.88)

Scaled Demand Index for "Pain Management Doctor"



States with Highest SDI for
“Pain Management Doctor”:

- | | |
|--------------|----------------|
| 1) Louisiana | 4) Mississippi |
| 2) Oklahoma | 5) Texas |
| 3) Alabama | 6) Arkansas |



America's Health
Rankings 2023

Spearman’s rho test revealed a moderate positive relationship for higher SDI of “pain management doctor” and poorer state health ranking ($r_s = 0.53903$, $p < 0.001$).

References

- 1) GlobalData Plc. The Complexities of Physician Supply and Demand: Projections From 2021 to 2036. Washington, DC: AAMC; 2024.
- 2) Niforatos JD, Feinstein MM, Pescatore RM. Search engine queries as a metric of public interest in anesthesia. *Anaesthesia and Intensive Care*. 2019;47(3):302-304.
- 3) Dang S, Pakhchanian H, Flynn E, Raiker R, Chloe T.L. Khoo, David Belyea; Estimating Patient Demand for Ophthalmologists in the United States using Google Trends. *Invest. Ophthalmol. Vis. Sci*. 2021;62(8):1724.
- 4) Shanawar Waris, Rahul Raiker, Nanda Siva, Monika Koirala, Haig Pakhchanian, Osama Boustany, Ahmed A. Khalid. *Journal of Clinical Oncology*. 2022 40:16_suppl, e18535-e18535